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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/663,843	09/15/2000	Hiromi Okubo	197311US2	4370

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EXAMINER	
LE, BRIAN Q	

ART UNIT	PAPER NUMBER
2623	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/663,843	Applicant(s) OKUBO ET AL.	
	Examiner Brian Q Le	Art Unit 2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) *3* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-13 and 16-34* is/are rejected.

7)☒ Claim(s) *14 and 15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 September 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10-13*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Amendment and Arguments

1. Applicant's amendment filed April 30, 2004, has been entered and made of record.

2. Applicant's arguments, see Amendment, filed 04/30/2004, with respect to the rejection(s)of claim(s) 1-13, 16-18, 20, 21, 24, and 26-34 under 35 U.S.C. 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Suzuki U.S. Patent No. 5,742,410.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 2, 4-10, and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi U.S. Patent 5,754,708 and further in view of Suzuki U.S. Patent No. 5,742,410.

Regarding claim 1, Hayashi teaches an image processing device (abstract), comprising:

A filtering unit (FIG. 8) configured to filter an input image with variable frequency characteristics (variable edge emphasis adjustment) (FIG. 12 and column 13, lines 16-23);

An edge detection unit configured to detect a magnitude of an edge appearing in the input image (FIG. 1A, element 4b); and

A degree-of-white–likeliness detection unit (gray level judging/detection) (FIG. 1B) configured to detect a degree of white-background likeliness in respect of a local area of the input image, wherein said filtering unit changes the variable frequency characteristics in

response to the magnitudes of edges (FIG. 12) and to the degrees of white-background likeliness (column 14, lines 1-15).

Hayashi does not clearly teaches an edge-magnitude-conversion unit configured to convert the detected magnitude of the edge into a filter factor responsive to the detected degree of white-background likeliness and wherein said filtering unit changes the variable frequency characteristics in response to the filter factor obtained by said edge-magnitude-conversion unit. However, Suzuki teaches an image processing method wherein an edge-magnitude-conversion unit (FIG. 11a and 11b) configured to convert the detected magnitude of the edge into a filter factor (convert the edge coefficient) (FIG. 17, element 214) responsive to the detected degree of white-background likeliness (black edge degree) (FIG. 9, element 118) (the determination of black edge degree is also result the determination of white-background likeliness as well. This is clearly discloses at FIG. 8) and filter unit changes the variable frequency characteristics in response to the filter factor (FIG. 7; column 5, lines 66-67) obtained by said edge-magnitude-conversion unit. Modifying Hayashi's method of processing image according to Suzuki would able to further calculate the color deviation/difference, chroma adjustment and further processing the image with edge conversion (column 5, lines 8-18). This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Hayashi according to Suzuki.

For claim 2, Hayashi teaches the image processing device wherein said degree-of-white-background-likeliness detection unit marks white backgrounds and boundary areas adjacent to the white backgrounds as white-background areas, and marks other areas as non-white-

background areas (The detection between the dotted image/detected area versus not detected area) (column 2, lines 37-65).

For claim 4, Hayashi teaches the image processing device wherein said edge-magnitude-conversion unit converts the magnitudes of edges such that the variable converts the detected magnitudes of the edge such that the variable frequency characteristics enhances high frequency components to an increased degree at edge areas as the degree of white-background likeliness increases (gray level adjustment, increases respectively, depends on the white-background likeliness/gray level increases) (column 13, lines 59-67 and column 14, lines 1-19).

For claim 5, Hayashi further teaches the image processing device wherein said filtering unit enhances high frequency characteristics of the variable frequency characteristics of the variable frequency characteristics at edge areas according to the filter factor, the enhancement of the high frequency characteristics being made relative to the variable frequency characteristics applied to non-edge areas (column 13, lines 59-67 and column 14, lines 1-19).

Referring to claim 6, Hayashi teaches the image processing device wherein said filtering unit includes:

A first filter having a frequency characteristic that is space invariant over all areas of the input image (Hayashi teaches the character/line area filter is giving the output regardless the selected areas of the input image) (FIG. 10, element 8B); and

A second filter (dotted image filter) (FIG. 10, element 8A) having a high-frequency-enhancement characteristic, and has an output level of the second filter being adjusted in response to the filter factor (column 11, lines 50-58).

Regarding claim 7, Hayashi discloses the image processing device wherein the frequency characteristic of said first filter enhances edges while suppressing generating of moiré in mesh-dot image areas (refrain moiré occurrences) (column 13, lines 10-14).

For claim 8, Hayashi also discloses the image processing device wherein said first filter has a band-frequency-enhancement characteristic (smoothing processing) (column 13, lines 10-14 and column 14, lines 20-27).

Regarding claims 9-10, please refer back to claims 1-2 and 6 respectively for further explanation.

For claim 30, please refer back to claim 1 for the explanation. Also, Hayashi teaches the image output unit configured to reproduce a filtered image (FIG. 1, element 11).

Regarding claim 31, please refer back to claim 2 for the explanation.

5. Claims 11-13, 16-18, 20-21, 24, 26-29, and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi U.S. Patent 5,754,708 and further in view of Sikes U.S. Patent No. 6,058,201.

For claim 11, please refer to claim 1 for the explanation of degree-of-white-background-likeliness concept. In addition, Hayashi teaches a gray-level conversion unit which configured to converts a gray level of the input multi-level image according to conversion characteristics that change in response to the degree of white-background likeliness (column 13, lines 50-55 and column 14, lines 1-15). Hayashi does not clearly teaches a detection of concentration of white pixels in a binary image obtained by binarizing an input multi-level image, and to detect a degree of white-background likeliness in respect of a local area of the input multi-level image in response to the detected concentration of white pixels. Sikes teaches an image processing

method further teaches a detection of concentration of white pixels in a binary image obtained by binarizing an input multi-level image, and to detect a degree of white-background likeliness in respect of a local area of the input multi-level image in response to the detected concentration of white pixels (column 12, lines 20-27). Modifying Hayashi's method of processing image according to Sikes would able to further calculate the concentration of white pixels in the whole image. This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Hayashi according to Sikes.

Also to claim 12, Hayashi teaches the image processing device wherein said gray-level conversion unit includes:

A plurality of gray-level conversion units (different gray level conversions) configured to convert the gray level of the input multi-level image according to respective conversion characteristics (column 4, lines 7-22); and

A selection unit (selector) configured to select one of said plurality of gray-level conversion units in response to the degree of white-background likeliness (FIG. 12).

For claim 13, please refer back to claim 2 for the explanation.

Regarding claim 16, Hayashi further teaches the image processing device wherein a gray-level conversion characteristic applied to the white-background areas converts an input gray level of the input multi-level image into a greater value than a gray-level conversion characteristic applied to the non-white-background areas in a range of input gray levels above a predetermined gray level (column 10, lines 1-23).

Regarding claims 17 and 18, please refer to claim 16 for the explanation.

For claim 20, Hayashi further teaches the image processing device wherein the input multi-level image supplied to said degree-of-white-background-likeliness detection unit is an image obtained after a filtering process that has such a frequency characteristic as to smooth isolated dots (FIG. 11, element 81 and column 13, lines 1-14).

Regarding claim 21, Hayashi discloses the image processing device wherein the input multi-level image supplied to said degree-of-white-background-likeliness detection unit is an image obtained after size-change process (FIG. 1, elements 2, 3, 4, 8, 10 and 11).

Regarding claim 24, please refer back to claims 11-12 for the explanation.

For claim 26, please refer back to claim 16 for further explanation.

For claim 27, please refer back to claim 11 for the explanation.

Regarding claim 28, please refer back to claim 12 for the explanation.

For claim 29, please refer back to claim 2 for the explanation.

For claim 32, please refer back to claim 11 and claim 12 for the explanation.

Regarding claim 33, please refer back to claim 12 for the explanation.

For claim 34, please refer back to claim 2 for the explanation.

6. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Hayashi U.S. Patent No. 5,754,708 and Sikes U.S. Patent No. 6,058,201 as applied to claim 11 above, and further in view of Farrell U.S. Patent No. 6,222,642.

Regarding claim 19, as discussed in claim 11, Hayashi teaches the gray-level conversion characteristic applied to the white-background area. In addition, Farrell teaches a method of processing image wherein the gray-level adjustment can be adjusted by user operation (column 3, lines 35-38). Modifying Hayashi's method of processing input images according to Farrell

would able to allow the user to adjust the gray-level of the image and thus improve the quality of the reproduced image. This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Hayashi according to Farrell.

7. Claims 22-23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Hayashi U.S. Patent No. 5,754,708 and Sikes U.S. Patent No. 6,058,201 as applied to claim 13 above, and further in view of Sakano U.S. Patent No. 5,473,444.

Regarding claim 22, Hayashi teaches a block-generation unit which divides an area-detected image into a plurality of blocks (FIG. 2, FIG. 3, FIG. 6, and FIG.7). However, Hayashi does not teach the count unit to keep tracks and mark the white-background pixel. Sakano teaches a method processes the image that keeps track and marks white-background pixel detection (FIG. 8 and column 4, lines 5-12). Modifying Hayashi's method of processing input images according to Sakano would able to distinguish and keep track of white-background pixels in the image processing. This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Hayashi according to Sakano.

For claim 23, Hayashi further teaches the image processing device wherein the blocks are square shaped (FIG. 3).

Regarding claim 25, Hayashi teaches area detection unit includes a thresholding unit which carries out thresholding of the input multi-level image to generate a binary image (please refer back to claim 16). In addition, Sakano further teaches the limitation of counting the white pixels (as discussed in claim 22), expansion unit (FIG. 12, element 193 and element 196; and column 4, lines 13-21) and logical AND unit which obtains a logical product of the binary image and an image in which white-background areas are expanded by said expansion unit (FIG.

12, element 194; FIG. 20, element 194; column 4, lines 55-67 and column 5, lines 54-67). Modifying Hayashi's method of processing input images according to Sakano would able to distinguish, keep track of white-background pixels in the image processing, and further expand the white-background pixel according to the count unit for further image processing. This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Hayashi according to Sakano.

Allowable Subject Matter

8. Claims 14 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

CITED REFERENCE

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to edge and gray-level detection with regard to white-background likeliness in general:

U.S. Pat. No. 5,600,736 to Hagita, teaches image pattern identification/recognition method.

U.S. Pat. No. 5,748,804 to Surka, teaches method for processing images with symbols with dense edges.

U.S. Pat. No. 6,674,478 to Miyazaki, teaches image processing method and providing medium.

Chesnaud et al., "Statistical region snake-based segmentation adapted to different physical noise models", I.E.E.E. Pattern Analysis and Machine Intelligence on Pages: 1145-1157 Vol. 21, Nov. 1999.

Kay et al., Edge detection using the linear model, I.E.E.E. Acoustics, Speech, and Signal Processing on Pages 1221-1227 Vol. 34, Oct. 1986.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

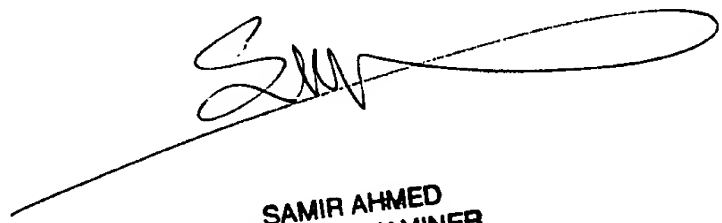
Contact Information

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Q Le whose telephone number is 703-305-5083. The examiner can normally be reached on 8:30 A.M - 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

BL
May 21, 2004



SAMIR AHMED
PRIMARY EXAMINER